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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/676,269	09/28/2000	Jian J. Chen	LAM1P151	6726

22434 7590 06/18/2002

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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT PAPER NUMBER

1763

DATE MAILED: 06/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/676,269

Applicant(s)

CHEN ET AL.

Examiner

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/25/02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 14-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of group I in Paper No. 7 is acknowledged.

Claims 14-21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 4, and 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Walko, II, U.S. Patent 6,051,100.

Walko, II, shows the invention as claimed including a plasma confining assembly (40,140) for minimizing unwanted plasma formations in regions outside of a process region in a process chamber 13, comprising: a first confining element 40 positioned proximate the periphery of the process region, and including an exposed conductive surface that is electrically grounded (see col. 8-line 66 to col. 9-line 57); and a second confining element 140 positioned proximate the periphery of the process region, and including an exposed insulating surface (see col. 9-lines 21-22), which is configured for covering a conductive portion that is electrically grounded, the second confining element 140 being spaced apart from the first confining element 40 (see col. 5, lines 30-32), wherein the first confining element and the second confining element substantially reduces the effects of plasma forming components that pass therebetween (see fig. 1).

With respect to claim 4, the plasma forming components are charged particles.

Concerning claims 11-13, either of the confining elements can contain a ceramic thereover (see col. 9-lines 21-22); a surface of the confinement elements formed from anodized aluminum is also disclosed (see col. 9-lines 18-21); and the confinement plate can be formed of aluminum which is either substantially resistant to etching by a plasma present within the chamber during the processing or contributes substantially no metal contamination.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lenz, U.S. Patent 5,998,932 in view of Deguchi, U.S. Patent 5,006,192.

Lenz shows the invention substantially as claimed including a plasma confining assembly for minimizing unwanted plasma formations in regions outside of a process region in a process chamber, comprising, for example a parallel plate structure as shown in fig. 1, containing: a confining element (302, 304) positioned proximate the periphery of the process region and in a lower portion of the process chamber in a ring surrounding the bottom electrode, and including an exposed insulating surface 302(a),

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which is configured for covering a conductive portion that is electrically grounded; and another confining element 102a, 102b formed from an insulating material and disposed between the first confining element and an upper portion of the process chamber, and proximate the periphery of the process region, the confinement element 102a, 102b being arranged to physically contain a plasma inside the process region and to substantially reduce the effects of plasma forming components that pass between the second confining element and an upper portion of the processing chamber.

Additionally, the confining element 102a, 102b is a ring that surrounds at least a portion of the process region, and is being configured to permit by-product gas from the processing to pass through while substantially confining the plasma inside the process region (see fig. 3 and col. 4-line 45 to col. 7-line 16).

Lenz fails to disclose a confining element positioned proximate the periphery of the process region, which includes an exposed conductive surface that is electrically grounded, the confining element disposed in an upper portion of the process chamber and surrounding an upper electrode. Deguchi discloses a confining element (6 or 10) positioned proximate the periphery of the process region, and including an exposed conductive surface that is electrically grounded, the first confining element being in an upper portion of the processing chamber in the form of a ring and surrounding the upper electrode (see fig. 3a and col. 5-line 24 to col. 6-line 20). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Lenz so as to include the confining element of Deguchi because this would allow for further confinement of the plasma at the upper region of

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the processing chamber, therefore optimizing the apparatus and the process performed therein.

Regarding claim 4, the plasma forming components in both Lenz and Deguchi are charged particles or electric fields.

Concerning claims 5-6, the apparatus of Lenz modified by the apparatus of Deguchi would contain the claimed first and second confining elements structure arrangement and therefore the apparatus of Lenz modified by Deguchi would have a first and second confining element arranged to direct charged particles to the exposed conductive surface and sink charged particles therethrough to ground so as to reduce the density of charged particles in regions outside the process region, and the elements would also be arranged to attract electric fields to the grounded conductive surface and the grounded conductive portion, respectively, so as to reduce the electrical field strength in regions outside of the process region.

With respect to claims 9 and 10 which describe an apparatus in which the first and second confining elements are interchanged, the rearrangement of parts of an apparatus does not render the apparatus patentable when the rearrangement of the parts of the apparatus would not have modified the operation of the apparatus (see *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950)).

With respect to claim 13, the first confining element of Deguchi is formed from stainless steel (see col. 3-lines 51-60), which is a material resistant to etching.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lenz, U.S. Patent 5,998,932 in view of Deguchi, U.S. Patent 5,006,192 as applied to claims 1-11 and 13 above, and further in view of Walko, II, U.S. Patent 6,051,100.

Lenz and Deguchi are applied as above but lack anticipation of the non-exposed conductive core of the second confining element formed from aluminum and the exposed insulating surface formed from anodized aluminum. Walko, II discloses a plasma confining element 40 where the outer surface is composed of anodized aluminum (see col. 9-lines 18-21). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a second confining element where the inner portion is aluminum and the outer exposed portion is anodized aluminum in the apparatus of Lenz modified by Deguchi because Walko, II shows this to be a suitable material to be used as a plasma confinement element.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 305-4545. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills, can be reached on 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 872-9310 for regular communications and 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.



Luz L. Alejandro
Patent Examiner
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June 16, 2002